

The Paracelsian Influence on Ottoman Medicine

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by: Nil Sari and M. Bedizel Zulfikar Galen's concept of medicine which dominated the medical world almost nearly for fifteen centuries began to loose its importance in the 16th century. At that time, Paracelsus (1493-1541) introduced a new medical understanding based on chemical principles. The Paracelsian theory, which changed gradually medical practice, influenced modern Ottoman medicine to a great extent. Paracelsus, the Swiss doctor, was introduced in Ottoman medical writings as a German hakîm from Austria. In this artile, the multifaceted influence of his school on Turkish Ottoman medicine is describe by means of various examples.

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1. Introduction

Galen's concept of medicine which dominated the medical world almost nearly for fifteen centuries began to loose its importance in the 16th century. Paracelsus (1493-1541) [1] who tried to eliminate the old medical concept, introduced a new medical understanding, based on chemical principles.



Figure 1: Portrait of Galen. Lithograph by Pierre Roche Vigneron. (Paris: Lithographie de Grégoire et Deneux, ca. 1865) (Source).

Besides, iatrochemists [2], iatropysichians [3] mechanists [4] and spiritualists [5] introduced new theories based on anatomy and other natural sciences. Their trends were popular during various periods [6] and consequently medical practice changed as well. Yet in the 18th century, the two fields of study, medicine and philosophy, were not definitely separated from each other [7].

Among these trends, the one that influenced the Ottoman medicine to a great extent was the trend started by Paracelsus and his followers. Paracelsus, whose name was spelled differently, such as "Barakelsus", "Baracelsus" and "Baraklisus", in the Ottoman medical writings, was introduced as a "Cermanî" (German) philosopher, or "hakîm" [8] from "Namca" (German or Austrian peoples) [9]. Paracelsus, a Swiss doctor, who was the representative of Renaissance chemistry, influenced Turkish medicine in many ways. We will try to describe these influences by means of examples.

2. The textual sources of the *Tibb-i Jadîd*

Although the *Tibb-i Jadîd* (New medicine) of that period has not yet been specifically studied, the Arabian copies of Sâlih bin Nasrullah's (d. 1669) [10] works have been studied [11]. Considering the importance and influence of the tradition of writing medical works in Turkish, which began in the 14th and 15th centuries and continued all through Ottoman medical history, we based our study on Turkish copies and so studied 17th and 18th centuries medical works highly influenced by Paracelsus [12]. Besides translations, amongst these works, there are also collections from different authors and also compilations and commentaries arranged and classified differently. When *Tibb-i Cedîd* is concerned, Paracelsus and his followers solely should not be considered. In the *Tibb-i Cedîd* literature many writers, be they followers of Paracelsus or not, such as Oswald Croll [13], Daniel Floravante [14], Sennert [15], some of them quite well known, others not heard about, were dictated.



Figure 2: Presumed portrait of Phillip von Hohenheim, known as Paracelsus (1493-1541), attributed to the school of Quentin Matsys (1466-1530). (Image in the public domain).

Sâlih b. Nasrullah who was highly influenced by Paracelsus, translated *Fî hâzâ Kitâbu't-Tibb al-Jadîd el-Kimyâvî allazî ihtiraa-i Baraklisus* [16] from him [17]. But his work *Nuzhat al-Abdân fî Tarcuma-i Gâyât al-'Itkân* may be taken as an exception in this respect, not any Paracelsusian influence being observable on it [18]. Because in the whole manuscript of 500 pages, in four long chapters, only one or two compositions of Paracelsus were quoted. In *Nuzhat al-Abdân*, new and old medicines are given comparatively. There are quotations from the representatives of the new medicine and European doctors and chemical doctors, along with those (such as bleeding) from Galen and Avicenna, the master of all [19]. Although there are a lot of quotations from German authors, such as "Senartus" (Sennert) [20], French "Gorduniyus" [21], and "Ferniliyus" [22], Austrian "Erfil Saksonî" [23], and "Felis" [24], only a few short pieces were quoted from Paracelsus [25]. In the third chapter of the first part "Ispenciya" and the nineteenth article, instruments necessary for the pharmacologist and technological equipment such as distillatory to produce perfumes and pharmacological material for preparation of medicine, methods long ago known in the world of Islam, are handled. Here, only the technical methods are clearly explained, but theoretical knowledge is not included. The fourth part [26], which is referred as a translation from Paracelsus, in fact has no relation, either with Paracelsus or "Tibb-i Jadîd", the new medicine. Those who study the old medicine can see that this part deals with classical toxicology, beginning with measures to be taken against getting poisoned by metals, ending with the therapy of rabies.

In *Tibb-i Kimyâî* [27] by Omer Sinan al-Iznîkî, [28] whose works are affected by Paracelsus, "kimyâ" (chemistry) is described as an originally Greek word, the "himya", meaning analysis and decomposition. In this same work, Iznîkî states that some regard this science as the art of Hermes (Sanat-i Hermesiyî) [29] and others as the secrets of oracles (sirr-i kahânat) [30]. According to Iznîkî, the main purpose of these people was to improve the metals and turn copper into silver and silver into gold. In his opinion, this was the case until Paracelsus, a German (Baraklisus el-Cermanî) who came forth and developed the art of chemistry, made it a part of medicine and called it "espâgîrika" (which literally means chemistry).

In the Ottoman literature this art is described as chemical medicine, *Tibb-i Kimyâî*. This art comprises also philosophy (hikma) [31] and the secrets of nature (*asrâr-i tabîat*). But its main field of study is about minerals

and their analysis and improvement by means of this art. According to the same work, if the primary aim of medical chemistry was improving minerals, the secondary aim was the protection of human health and the treatment of diseases. As we shall see later, Ottoman doctors were more interested in practice than with theories, philosophy and mysticism. However, books started with the theories of chemical physicians, such as Paracelsus' and Crollius', instead of the old theory of the four humours. Besides this, comparative quotations were made from Hermes, Aristotle and Plato. The ideas of Paracelsus and his followers occur intermingled with other philosophers' ideas.

The *Kitâb-i Kunûz-i Hayât al-Insan Kavânîn-i Atıbbâ-i Feylesofân* [32] of İznîkî consists of two parts. The first part begins with the philosophy of nature and the origin of species, whilst the second contains simple and compound medicine, administered and known to be useful, selected from famous books of skilled Arabian, Persian, Greek and European physicians. They are given under the titles of sap, oil, ointment, spirits, elixir and balsam etc. Here, also, the old and new medicines are intermixed [33].

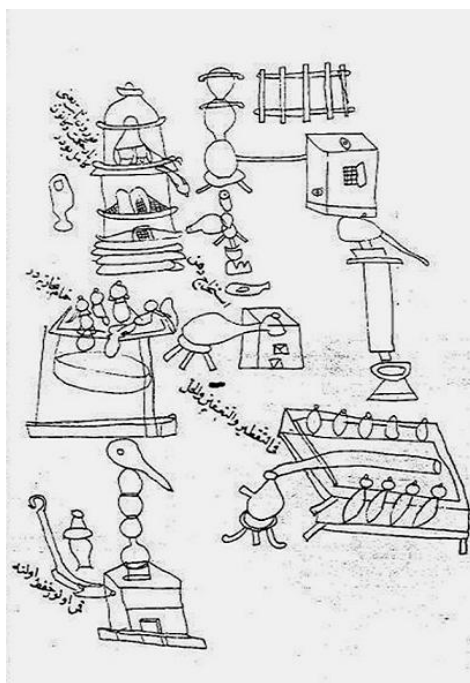


Figure 3: Apparatus for distilling essence; furnace and bath (vapor heating). Source: Omer Sifâî, *Jawhar al-Farîd fî Tibb al-Jadîd*, Suleymaniye Library in Istanbul, MS Hamidiye 1020.

Another Ottoman physician influenced by Paracelsus is Omer Shifâî (death 1742) [34]. Shifâî informs in his book, *Javhar al-Farîd fî al-Tibbî 'l-Jadîd* [35] that the selected chemical medicine (Tibb-i Kimyâî) preparations, suitable for the rulers' temperament and the disposition of the noble, quoted from the books of Latin philosopher physicians (Hukemâ-i Latin Feylesoflan) and translated them from various European languages (Frenkce) to western Turkish (Turki-i Rûm) [36]. Shifâî, like İznîkî, beginning with a definition and short history of chemistry, goes on to inform that a philosopher named the Austrian Paracelsus (Cermanî Baraklisus) came out and described the characteristics of different minerals and their effects, the way these minerals are influenced and directed by the movements of the heavens, and the origin of the plant and animal species. Being familiar with the secrets of stones, he divided the science of chemistry into different subjects, by strange terms and odd words; Paracelsus regarded chemistry as a branch of medicine and called it "İspenci-yâr" [37]. Shifâî is aware of the queerness of Paracelsus' theory; however he quotes this strange theory in his book. The subject matter and the text of this book is similar to that of İznîkî.

There are quotations from Paracelsus and his followers in Shifâî's works *Minhâj al-Sifat fî al-Tibb al-Kimyâî* [38] and *Tibb-i Jadîd al-Kimyâî* [39].

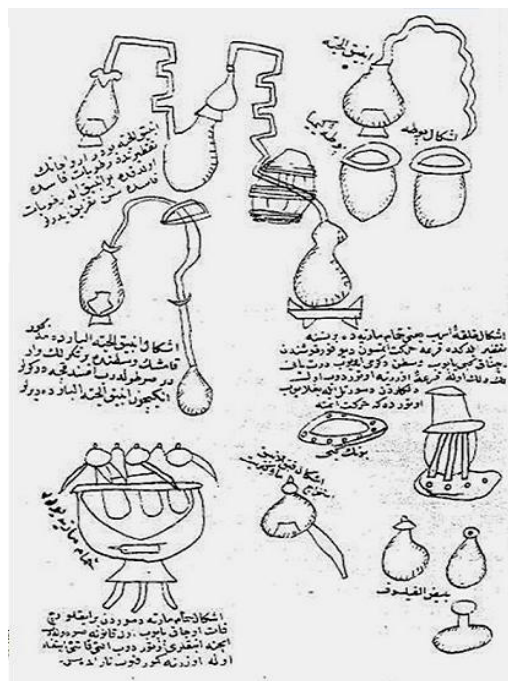


Figure 4: Several kinds of stills and the double boiler (Bain Marie). Source: O. Sifâî, *Jawhar al-Farîd fî Tibb al-Jadîd*, Suleymaniye Library, MS Hamidiye 1020.

Gevrekzâde Hafiz Hasan Efendi (d. 1801) [40] states in the beginning of this book *Mursid al-Alibba fî Tarcamati Ispagorya* [41] that he had made translations from Paracelsus and Crollius and added commentaries to them' [42].

Another important book on the Paracelsusian new medicine (Tibb-i Jadîd) is *Kasîr al-Naf'*, of which the author is unknown [43]. Differing from the books of the above mentioned writers, this book, existing in only one known copy, is the most comprehensive book on the new medicine (*Tibb-i Jadîd*).

3. Influence of the Paracelsusian medicine

In what way did the Paracelsusian medicine influence the Ottoman medicine?

The main change concerns the philosophy of medicine which had a great impact on the old humoral pathology theory. But from time to time this new theory was mixed up with the humoral theory. According to the humoral theory, which explains the composition of matter and comments on illnesses, everything is composed of four elements, namely fire, air, water and earth. In accordance with the same theory, matter is composed of four properties, coldness, warmth, dryness and moistness; there are four humours in the body: blood, phlegm, yellow bile and black bile, besides four temperaments, sanguine, phlegmatic, choleric, melancholic [44].

The above mentioned elements, which formed the basis of the old medicine, were included in the "great secret" (*Sirr-i Akbar*). The divine secret implies the creator, indefinable, invisible, unconceivable and indescribable. The whole universe, images, forms, colours, tastes, etc., are born from the divine secret [45]. He also is the beginning of life as well as the beginning of motion, force and dispositions. However, it is also clear that it was not easy to give up the humoral theory which was approved for centuries without a doubt. Therefore, the humoral theory got mixed with the new theory. When God created the matter in its first form (*hayûli-i awalî*) and the great secret, four elements (*anâsir-i arbaa*) emerged from it. All living creatures are made up of the four elements. These elements have visible (*zâhirî*) and invisible (*bâtînî*) aspects. Internal (*bâtînî*) secrets are hidden inside. These are impossible to change or spoil. Only the visible form can be

disintegrated, spoiled or change form [46].

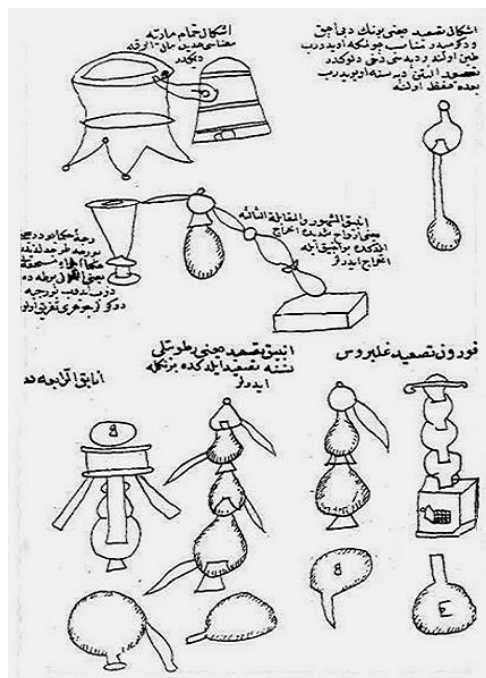


Figure 5: Several kinds of apparatus used in the process of sublimation; furnace, the double boiler and stills. (O. Sifât, *Jawhar al-Farid fi Tibb al-Jadid*, Suleymaniye Library, MS Hamidiye 1020).

According to Paracelsus and his followers, the elements consist in two forms, external and internal. Physic is an example of the external element and the ego or soul (*nafs*) is an example for the internal element. The internal element is the one that provides for continuation of the species. The external element is the part which can be changed and spoiled [47]. In alchemy and chemistry, the properties of the four elements are described as: earth (the visible solid part), fire (the secret and fine part), water (visible liquid form), and air (the invisible gaseous form) [48].

Paracelsus does not deny completely the role of the four elements as a material factor of illness and health; however they are not as affective as the school of Calinos claims. What is important is the existence of the three principles in each organ. The first principle is combustibility; the second is volatility; and the third is incombustibility and remain as ash. Paracelsus calls the three principles as sulphur, mercury and salt [49].

We find this new point of view reflected in the Ottoman medical literature as in the following phrases [50]:

"Those who are the followers of the new medicine said of the composition of things that, objects are consistent of three essential elements:

Sulphur (*kibrîr*): the solid, stable principle; oiliness (*duhniyyet*) salt (*milh*): extract, sap, stable dense earth (*sabit galiz arzî*);

Mercury (*zibak*): volatility principle (*rutubet-i seyyare*); volatile gas (*ruh-i tâîre*): vaporizable, which could not resist fire.

All matter is composed of these three essences. As a result of this existence in three forms, there is:

Mineral salt, mineral mercury and mineral sulphur; plant salt, plant mercury and plant sulphur; animal salt,

animal mercury and animal sulphur. The essence of all poisons is salt [51]."



Figure 6: Turning a fistula into in rhinophyma treatment by a Muslim surgeon. Miniature in Sharaf al-Din Sabuncuoglu's book *Cerrahiyat al-Hâniyya*. Picture copied by the permission of Nil Sari and Ulker Erke (*The 38th International Congress on History of Medicine, Turkish Medical History Through Miniature Pictures Exhibition*, responsables U. Erke and N. Sari, Istanbul 2002).

In medical manuscripts, under the title "Hermes' words", we find this statement:

"Mercury (the volatile principle) is primarily a spirit; sulphur (the solid principle) is primarily the ego (*nafs*) and salt (extract/*hulasa*), which is primarily an object" [52].

As a result of Paracelsus and his followers' influence, the Hermetic philosophy gained importance and technical methods such as distillation, boiling and calcification, intermingled with philosophy.

Paracelsus' concept of the Universe was composed of natural magic, Hermetic philosophy, alchemy, astrology and divinity. This new philosophy and practice, based on chemical studies and analogies [53], was introduced into the Ottoman literature as "*Tibb-i Jadîd*", the new medicine.

Another important change which took place, as a result of the influence of Paracelsus, is the appearance of the philosophy of nature in medical literature.

According to Paracelsus, creation and the appearance of species with their special characteristics, as well as the protection of these characteristics, and also the transformation and the degeneration of the characteristics of species, took place in three phases [54]:

In the first step, the "activating thought" causes plant, mineral and animal species, to mature. In the second phase, the power hidden in the matter makes the first form of the matter. In the third phase, the protection of the species is realized by a divine order.

Yet, some objects, for example celestial elements could not be changed or degenerated. However, some objects can change through the influence of the moon and the stars.

Thus, we see that subjects dealt with in the books of philosophy, astrology and secret sciences, mixed up with theology, began to penetrate into medical literature, a subject not found in the older Ottoman medical manuscripts. Astrology, allegory of micro and macro cosmos [55], the idea that star constellations influence human fate, health and illness, existed since the ancient Greeks. But these were not included in Ottoman medical works, which could be identified as secular, before the new medicine (*Tibb-i Jadid*). The idea that stars could cause illness for their distant places did not agree with the old medical thought, which was an extension of the Aristotelian logic and Hippocratic medicine [56].

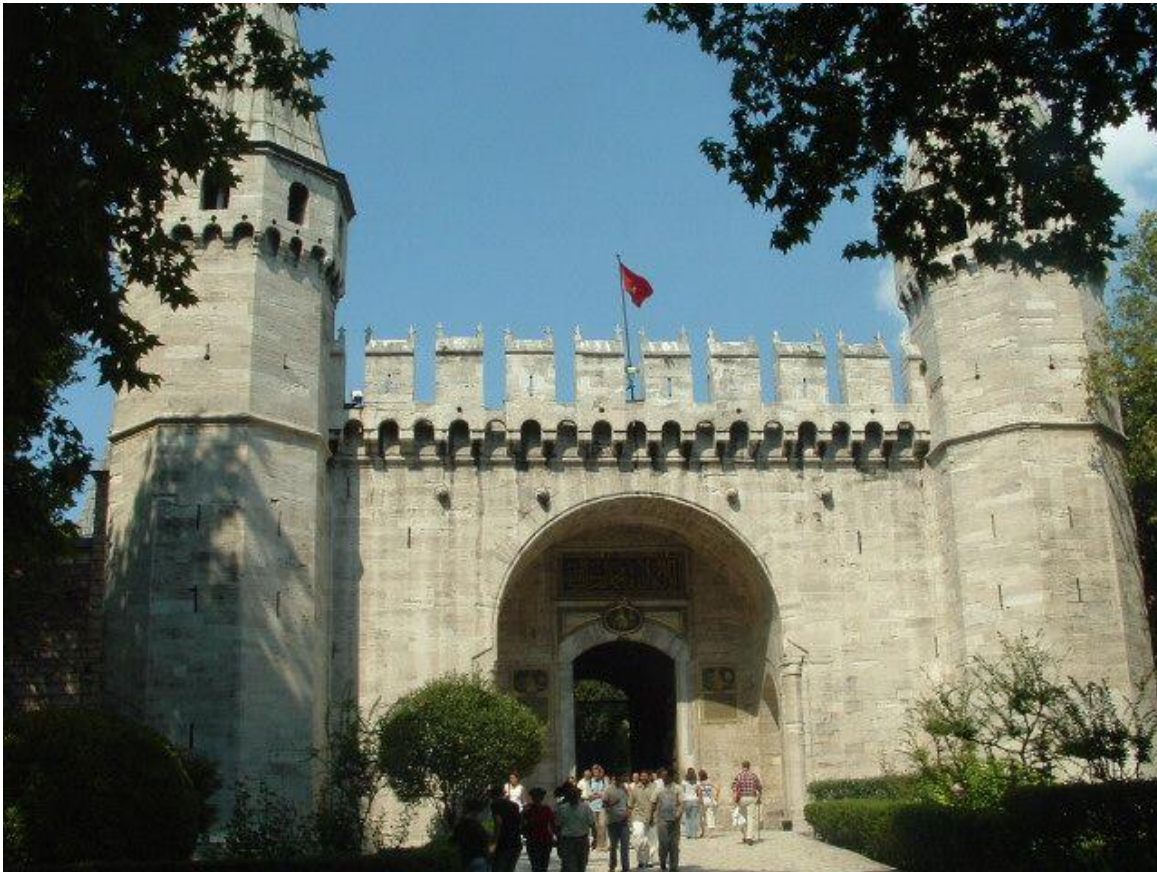


Figure 7: The Gate of Topkapi Palace.

Paracelsus, while replying the questions "what is a human being", "what is a disease", established a relation between the micro cosmos, the human being and the universe. Since the world and the human being originated from the nature and the creator, the human being and illnesses should be studied together with them [57].

Thus, in "*Tibb-i Jadid*" literature, subjects related to the bases of existence, reproduction of plants and animals, increase of minerals were described sometimes in relation with philosophy and sometimes depending on observation and quotations. In the writings about the mating of animals, it is said that some animals reproduced by putrefaction and so here we see the old medical theory of spontaneous generation.

The existence and increase of plants and metals were realized as a result of the motion of the heavens, rising and setting and the distance of celestial bodies. However, the heavens, which are the source of existence in the great sphere (*Kura-i Ulyâ*), are not in need of the source of birth and existence, because they are mature enough, they won't change or degenerate. Besides the endless effects, such as winds, rain and snow, stars have visible impressions in this universe, such as minerals, plants and animals [58].

A body grows its characteristic form, develops and matures. Between two species, which attained complete maturity, a new species resembling both of them can arise. For example, as a mule is breeder from a donkey and a horse; a high breed, from a dog and a wolf, another kind of metal or plant can be produced from two kinds [59]. Thus, a radish ("salgam": Semen Rapae) may mutate to be a turnip ("turp": Semen Raphani) and a mint ("yarpuz": M. pulegium) from a pennyroyal ("nane": Mentha piperita). If you split a citron ("agac kavunu": C. medica) and a flax seed ("keten tohumu": Semen Lini) is sown into it, and buried in the ground, a new plant, similar to the two main species, grows. One of the kinds being dominant over the other, the new product will be more similar to it [60]. And here, it is emphasized within the framework of alchemy concept, that as a result of the mating of two species from the same family, hybrids will arise and, in the meantime, some very strange examples are given. According to this theory, this is valid for stones, too. Indeed, the essence of diamond is lead, of emerald, copper and of ruby, iron. What substances turn into crystals, are explained here. But, conclusions impossible to arrive by means of the knowledge and technology of the age are reached by speculation and analogy [61].

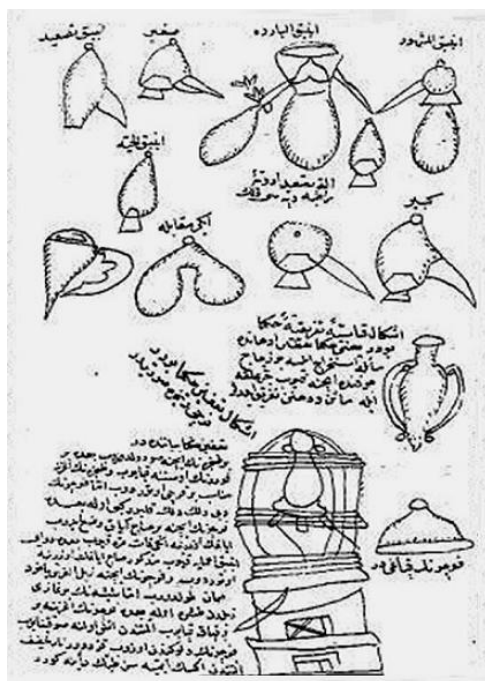


Figure 8: Several kinds of apparatus used in the process of sublimation: stills, condensers; apparatus for distilling essence. (O. Sifâi, *Jawhar al-Farid fî Tibb al-Jadid*, Suleymaniye Library, MS Hamidiye 1020).

According to the news from the Europe (Frengistan), strange creatures, born as animals, growing up as plants or vice versa are said to have been seen in Holland [62]. These remind us Pliny's [63] stories. All these examples aim to show us that the shapes of objects are changeable, but the essential species that is internal, being permanent, will not change.

A concept of life and soul was developed for all objects, too. Objects have special qualities and characteristics of their own species, in maturity. These characteristics of each species appear in motion, colour and form.

If a mineral has vitality, its character and qualities are permanent. For this reason, minerals can increase. In *Kasîru'n-Naf'*, the following stories from Austria (Namca) are quoted:

"There was gold ore in that land. It increased in every four years, reaching its original amount. They dug out lead ore in Croat and Latin Europe (Latin'de) and found silver. And there was iron ore, which increased every ten years to attain its former amount. They found sand containing copper, which they dug some time

later and saw that it had changed into gold. Other minerals and stones are similar. And they said that it is the only one order (amr-i vâhid) that establishes all connections. Yet, the kind of metal which it's going to transform depends on the ability of the mineral" [64]. Here, besides the transmutation of minerals, it is spoken of the existence of a power which forms minerals that were formed in millions of years, in ten or fifteen years. There is a spirit of every mineral, which establishes connections [65]. The vital principle, which Paracelsus called "archaeus", is the power that provides for the vitality of the organism.

Paracelsus assumes in his "Volumen Paramirum" that, there are four factors determining health and illness, which we find in Ottoman medical manuscripts influenced by Paracelsus, too [66]. Of these we note the "ens astrale" and "ens naturale" concepts. Those born within a certain period of time have a fate depending upon their birth days; but at the same time they are unlike, because the effects of the stars are different. Consequently, human beings are unlike [67] [68]. Another concept often mentioned in the Turkish medical writings is "ens veneni", that is the fact that matter has both good and evil properties [69].

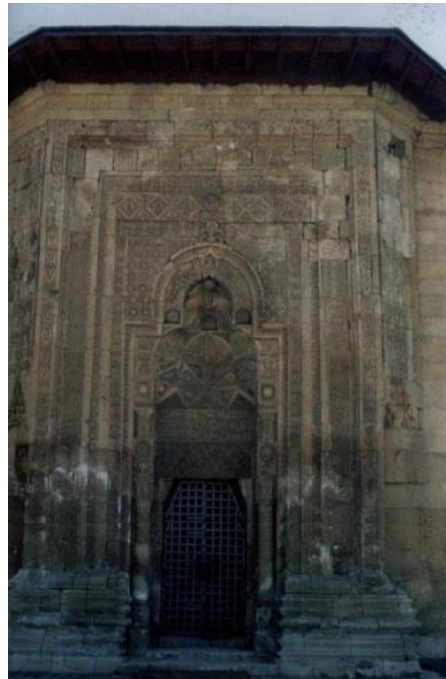


Figure 9: The Gate of Divrigi Dar Al-Shifa, Divrigi/Sivas, Turkey. Ord. Prof. Dr. A. Süheyl Ünver Nakışhanesi Yorumuyla Divrigi Ulucami ve Sifahanesi Tas Bezemeleri, VIII. Turk Tıp Tarihi Kongresi 16-18 Haziran 2004 Sivas-Divrigi (ed. Nil Sari, G. Mesara, N. Colpan), Istanbul 2004, p. 27.

Another important influence of Paracelsusian school of medicine on the Ottoman medicine is the occurrence of the idea of micro and macro cosmos in the "Tibb-i Jadîd" manuscripts. "Âlem-i sagîr" represented the human being, that is micro cosmos; "Âlem-i akbar" represented the universe (stars, heavens), that is macro cosmos. Both the human being and the universe consist of the spirit and visible, physical aspects.

The essence of all creatures exists in the human being. The heart, which is the beginning of life in man, is like the sun. The sun, which is the source of life in animals, plants and minerals, is the source of the secret sciences, as well. There are seven organs in man, corresponding to the seven planets. The brain relates to the Moon, lungs to Mercury, gall bladder to Mars, spleen to Saturn, genital organs to Venus, and liver to Jupiter, in the same way as the Sun relates to the heart. We find facts in man, similar to those in nature. As there are earthquakes on earth, there are trembling and shiver in man; man urinate and has diarrhoea, as it rains in the world [70].

This is briefly all that is introduced from the theory of Paracelsus to the medical literature, by the Ottoman

physicians.

4. Medical practice in the light of the Paracelsian influence

Considering the mass of the Ottoman "Tibb-i Jadîd" manuscripts, medical philosophy occupies a small part, when compared with the content of each book, and it has an introductory character. Almost all of the books consist nearly drug compositions obtained by technical methods. It is seen that, in time, Paracelsus' philosophy came to be neglected and only the useful drug compositions remained. This fact proves that Ottoman doctors pay more attention to practice than philosophy.

In the old medical literature, not only magic and sorcery was omitted, but Tibb-i Jadîd literature of alchemy, astrology and mysticism was criticized, too. Omer b. Sinan indicated that chemistry was not his discovery, but he brought strange ideas along with a new technique:

"Paracelsus found some medical methods in the old way and introduced new terminology and strange expressions. He thinks that he himself founded this science, which is not true. But, he invented terms and strange phrases; and the methods of medical art described by him are the product of his own philosophy" [71].

Some medical historians [72] try to explain the main reason why the Ottoman medicine was mostly influenced by Paracelsus and his followers, with the fact that, this school was mystical and in harmony with the Islamic way of thought. We do not agree with this assumption. Because, Paracelsusian school favours superstition and magic, so contradicts Islam. For this reason, Paracelsus' theory was introduced shortly, as a transfer of new compositions was mainly emphasized. Then, why did his new kind of information and techniques of preparing drugs and new current influenced the Ottoman world so deeply? As we also understand from medical literature that, medical, as well as commercial and diplomatic relations between the Ottoman world and the west, especially Italy, took an important place, during this period [73]. Many European (French) doctors and their therapies are mentioned in manuscripts. We know that during this period, many doctors came from the west, and especially Venice, to work in Istanbul, served in the Palace and naturally some of them acted as spies [74]. European (French) and above all physicians from Venice, came to Empire and while practicing must have affected their colleague.

Naturally, another important factor for adopting the new medicine was the interest in new drugs and the hope of finding new treatment for incurable illnesses.

We come across very clear and definite descriptions recorded in "Tibb-i Jadîd" manuscripts. For instance, completely technical methods are described, as in the following:

"Distil in a copper still, then distil it in ("hamam-i mâriyye": Bain Marie) [75]" and keep it; Distil it in a double boiler on heated sand (nar-i reml); keep it for twenty days on a double boiler, put it in a pot and heat it on strong fire (nâr-i shedîd for about five hours; sublimate in a long necked distillation apparatus (tavîtu'l-unk) [76] for eight hours; evaporate the moisture in curved necked distillation apparatus (mâilu'r-rakabe) [77] on light fire" [78].

The prevailing use of drug compositions in "Tibb-i Jadîd" manuscripts, reminds the Acrabadins of the old medicine. But, the main difference between them is that, in the new medical books, the way to obtain its raw material is described for each composition. Another important difference is that, while inorganic material was generally used externally and less often in the old medicine, in the new medicine it was used more frequently and was administered orally.

We can consider this period as the beginning of medical chemistry and chemotherapy. The doctor, who served as a pharmacologist in the past, came to undertake the role of chemist, as well; and for this reason, these physicians were called chemist doctors, "hukemâ-i kimyayyûn". In other words, the old kind of doctor made only different kinds of medical compositions when needed; the doctor of the new school was expected to produce the raw material of the drug, too. In fact, the usage of inorganic material in medicine and techniques such as distillation, heating, cooking and Bain Marie was known and practiced for a long time [79]. Indeed, the techniques described in the books of "Tibb-i Jadîd" are also very simple. Thus the innovation was the concept of "chemist doctor" and the usage of inorganic material more effectively and in higher doses.

When we study "Tibb-i Jadîd" medical literature, we see that medical compositions, believed to be prepared by Paracelsus, were dominantly herbal medical compositions and even drugs solely from herbal saps existed. For instance, the composition of the mastic solution prescribed for gastric troubles contain only mastic ("sakiz": Cummi mastix), nutmeg ("kucuk Hindistan cevizi": Semen Myristicae), clove ("karanfil": Flos Caryophylli), cinnamon ("tarcin": Cortex Cinnamoni) and misk apple ("misk elmasi") [80]. But no inorganic matter was added. We can give more examples on this matter [81]. Herbs were sometimes used for oxidation, as well [82].

Paracelsus' search for a specific drug for every illness, led him to study the effective matter of every material. While in the old medicine, mixtures were made of drugs, Paracelsus tried to analyse and isolate effective elements in them. We know that Paracelsus did not approve poly pharmacy; because one drug neutralized the other. However, very extensive drug mixtures are prescribed in the literature of the new medicine (Tibb-i Jadîd), just as in the old. For instance, a medicine for infectious diseases is composed of 26 drugs [83]. It is very seldom that a medicine composed of two drugs is prescribed. But, in the former, that is the new medicine drugs are included in the prescriptions after treatment with several pharmacological techniques.

Another remarkable point is that the writers of the new medicine didn't favour the Paracelsusian theories on the etiology of disease. According to the old medicine, illnesses occurred as a result of the imbalance of humours, due to their shortage or excess. While the old physicians looked for the cause of illness in the human body, on the contrary, Paracelsus considered them to be due to external factors, minerals, atmosphere, "poisons" originating from stars, etc. In this way, a special foreign agent gets in the body and dominates it [84]. The Ottoman doctors didn't favour this etiology of illness very much. Moreover, strange to say, methods such as sweating, getting one vomited, administering purgatives, bleeding and enema in order to cure the sick by purging bad humours out of the body, is not recorded in the "Tibb-i Jadîd" manuscripts.

The properties of drugs, such as being cold or warm, are no longer mentioned. In the old medicine contrasts in therapy, that is cold medicine for the illnesses of the hot nature, was prevailed, while Paracelsus favoured the therapy by means of similarities, such as homeopathic principles [85]. Paracelsus' interest in the likenesses and the theory of "signatures" [86], oriented him to a tendency of this sort.

Another important point is that, foreign terminology wasn't quoted in the text. Both the names of plants and minerals, and the name of illnesses are same as those used in the old medicine. The treatment of "mal-i hulya" [87], "sevda" [88], "sudde" [89], "tesennuc" [90] "gashy" [91] and "hafakan" [92] were again treated with the preparations of the new medicine [93]. Even "dense phlegm" (galîz balgam) and "feverish humours" (yakici hiltlar) were prescribed.

5. Evaluation of the Paracelsian Influence

Did all the Ottoman doctors favour the Paracelsusian medicine? No. All the writers on the modern medicine record the disputes between the followers of the new and old medicine. Medical historians of the west record similar controversies amongst the European doctors" [94].

It is also pointed out that, because their poison is very strong, minerals should be carefully used. The importance of removing the poison of minerals is also emphasized. According to the followers of the new medicine, the variety of the drugs of the old medicine is many, but they're not effective enough. The number of ingredients of the drugs in the new medicine was few, but they were very effective and pleasantly flavoured and consequently not disliked by the patient.

However, writers of the new medicine point out that the medicine of Paracelsus was not intelligible enough, for in translation from one language into another, some words sounded meaningless and in addition the medicine of Paracelsus was full of symbols. Gevrekzâde says, "I also translated the new medicine, but I had comment on the difficult parts" [95]. Gevrekzâde notes that some people didn't believe in curing by means of minerals and they said that these caused death because of their poisonousness. But, according to Gevrekzâde, they dare say these, because they are ignorant of the said science.

Gevrekzâde both praises and warns those, who administer the new medicine:

"With this art of chemistry, minerals are softened and its poison is turned into antidote, by analyzing and purifying. They become drugs for several illnesses, with their strong influence. But the effects of minerals, "which is very strong on human beings, is unlike to the effects of plants, so it's not right for everyone to try them to administer. It isn't proper to receive these drugs from anyone [96].

We find these discussions of the old and the new medicine in the other medical manuscripts, too. Thus, during the reign of Sultan Ahmed III (1703-1730), a decree was issued to prevent some ignorant doctors from practicing the new medicine (1704). The decree began as the following:

"Some charlatan European (Frenk) doctors left the school of the old medicine, and administering some drugs under the name of the new medicine, gave harm to some patients; Mehmed, the convert, and his partner, a European (Frenk) doctor, who had started an office at Adrianople, were expelled from the city" [97].

Certainly, this edict did not put an end to writing on the new medicine. We conclude from medical manuscripts that more care was taken in this method.

How long did the effect of the new medicine continue on the Ottoman medicine? When we study the dates of the copies on the modern medicine, we conclude that this trend continued until the end of the 18th century. We see that, later translations were made from other western physicians and the philosophy of the new chemical medicine (*Tibb-i Jadîd-i Kimyâî*) left its place to the new concepts.

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- Gevrekzâde Hafiz Hasan: *Tarcama-i Tibb al-Jadîd al-Kimyâî li Baraklisus*. Cerrahpasa Medical History Department Library. No: 668.
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- Kasîr al-Nâf: Cerrahpasa Medical History Department Library. No: 434.
- Omer b. Sinan el-Iznîkî: *Kitâb-i Kunûz-i Hayâtü'l-İnsan Kavânîn-i Atibbâ-i Feylesofân*. Istanbul University Library. T. Y. 7140.
- Omer b. Sinan el-Iznîkî: *Sifâ al-Muminîn (Al-Tibb-i Kimyâî)*. Istanbul University Library. T.Y. 7083.
- Omer Sifai: *Jawhar al-Farîd fî't-Tibb al-Jadîd*. Cerrahpasa Medical History Department Library. No: 195/1.
- Omer Sifai: *Minhâcu's-Sifâ fî Tibb al-Kimyâî*. Istanbul University Library. No: 7072.
- Omer Sifâî: *Tibb-i Jadîd al-Kimyâî*. Istanbul University Library. T.Y. 7103.
- Sâlih b. Nasrullah: *Fî hâzâ Kitâbu't-Tibb al-Jadîd el-Kimyâvî allajî İhtirâ'a-i Baraklisus*. Suleymaniye Library. Ayasofya section. No: 367/1; Hafid Efendi section. No: 269/1.

- Sâlih b. Nasrullah: *Nuzhet al-Abdân fî Tarcamai Gâyat al-Itkân*. Cerrahpasa Medical History Department. No: 539, 544; Fatih Millet Library. Tib Section, No: 328.

Footnotes

[1] Paracelsus (Theophrastus Bombastus von Hohenheim Paraceicus) (1493-1541); Born in Switzerland, he took his doctors decree on Leonicensus and afterwards travelled all over Europe. He come to Basel in 1527 and worked there as a professor of medicine. Paracelsus introduced "chemical therapy", using inorganic compounds (especially minerals) and started to teach in German, instead of Latin, which had been used until then, and wrote his works in his native language, German. (See: Ernst Kaiser: *Paracelsus*. Hamburg, 1984; H.E. Sigerist: *On the History of Medicine*. New York, 1960, pp. 162-176; F.H. Garrison: op. cit., pp. 204-207).

[2] Iatrochimique: The chemistry school: The school accepting the concepts regarding vital events as a series of chemical reactions. The founder of this school, von Helmont of Belgium (1577-1644), like his teacher Paracelsus, believes that all physiological processes in the body are controlled by a special spirit and also believes that all physiological events are chemical. The other prominent names of this school are Sylvius and Willis. (See: F.H. Garrison: op. cit., pp. 261-264 Also see: F.N. Uzluk: *Genel Tıp Tarihi I*. Ankara, 1958, p. 158; B. Sehsuvaroglu: *Eczacılık Tarihi Dersleri*. Istanbul, 1970, p. 210).

[3] Iatrophysique: School of mathematics: The school that tries to explain all physiological or vital events by the laws of physics. According to this concept, all physiological events are considered to be a result of physical laws. The prominent names of this school are Descartes, Borelli and Sanctorius. (See: F.H. Garrison: op. cit., pp. 257-261; Also see: F.N. Uzluk: op. cit., p. 115; B. Sehsuvaroglu: op. cit., p. 210).

[4] Mechanacalism: the school of mechanism: the school which regards, all kinds of activity of all creatures could be explained in accordance by the laws of physics and mechanics. (See: O. Hancerlioglu: *Felsefe Ansiklopedisi*. Istanbul, 1977, 4. vol., p. 117).

[5] Spiritualism: The theory that tries to explain the act of will and ail kinds of behaviour within the frame of spiritual factor rather than physiological processes. (See: O. Hancerlioglu: op. cit., 5 vol. p. 358).

[6] See: H.E. Sigerist: op. cit., pp. 67-68.

[7] See: H.E. Sigerist: Ibid. p. 80.

[8] Hakîm: Philosopher: Acquiring theoretical learning; forming the habit of trying to do one's best in everything he tries to and so achieving the perfection of the soul. The alchemists also called their art "hikma". (See: *Islam Ansiklopedisi*. Istanbul, 1977, 5/1. vol., p. 481).

[9] See foot note number 15.

[10] Sâlih b. Nasrullah (7-1669): Known as "Ibn Sellum", he was educated in medicine in Aleppo Hospital. He worked for the governor Aleppo, Ibsir Pasha. On coming to Istanbul he worked in Fatih Hospital as the head physician and in 1656 he was promoted to be minister of health, which position he continued to hold until his death. (See: B. Sehsuvaroglu: op. cit., pp. 293-298; B. Sehsuvaroglu: *Türk Tıp Tarihi*. Bursa, 1985, pp. 95-100; K.S. Kolta: "Hekimbasi Sâlih b. Nasrullah b. Sellum'un gorusune gore Paracelsus". *Türk-Alman Tibbi İlişkileri Sempozyum Bildirileri, 18-19 Ekim 1976*, Istanbul, 1981, pp. 93-94; Mehmed Tahir (Bursali): *Osmanlı Muellifleri*. Istanbul, 1975, 3. vol., p. 230).

[11] In his above mentioned article, Kolta declares that Ernst Seidel, M. Meyerhof-Monerot-Dumaine, Georges Vajda, Felix Franke-Klein and Paul Richter made several studies on the subject and especially on Nasrullah's work, *Gâyat al-Itkan*, written in Arabic. (See: op. cit., pp. 94-95).

[12] List of the manuscripts studied: Sâlih b. Nasrullah's works studied: *Fî hâzâ Kitâbu't-Tibbe'l-Jadîd el-Kimyâi Ellezî İhtiraa-i Baraklisus*. Suleymaniye Library. Hafîd Efendi Section. No: 269/1: Ayasofya Section, No: 367/1. (Arabian Manuscript); *Nuzhet al-Abdân fî Tarcamai Gâyat al-Itkân*. Cerrahpasa Medical History Department Library. No: 539, 544; Fatih Millet Library. Tib Section. No: 328. (Turkish Manuscript). Omer b. Sinan's works studied: *Kitâb-i Kunûz-i Hayât al-İnsan Kavânîn-i Atibbâ-i Feylesofan*. Istanbul University Library T. Y. 7140. (Turkish Manuscript); *Shifâ al-Muminîn (Al-Tibb-i Kimyâî)*. Istanbul University Library. T.Y. 7083. (Turkish Manuscript). Omer Shifâî's works studied: *Jawhar al-Ferîd fî al-Tibb al-Jadîd*. Cerrahpasa Medical History Department Library. No: 196/1. (Turkish Manuscript); *Minhac al-Shifâî fî al-Tibb al-Kimyâî*. Istanbul University Library. T. Y. 7072. (Turkish Manuscript); *Tibb-i Jadîd al-Kimyâî*. Istanbul University Library. T. Y. 7103. (Turkish Manuscript). Gevrekzâde Hâfiz Hasan's works studied: *Mursîd al-Alibbâ fî Tarcamati Ispagorya*, Istanbul University Library. T. Y. 7085; Cerrahpasa Medical History Department Library. No: 161/1. (Turkish Manuscripts); *Tarcama-i Tibb al-Jadîd al-Kimyâî li Baraklisus*. Cerrahpasa Medical History Department Library. No: 668. (Turkish Manuscript); *Kasîr al-Nef'*; Cerrahpasa Medical History Department Library. No: 434.

[13] Oswald Croll (1580-1609): Physician and iatrochemist. He was the private doctor of Prince Christian von Anhalt Bemburg and Ral Kaiser Rudolphs II. In his book "Basilica Chymica", he put forth similar medical concepts as Paracelsus and introduced many new medical compositions. (See: *Brockhouse Enzyklopadie*. Wiesbaden. 1968, 4. vol. p. 206).

[14] Florovanti (1520-1582): Italian alchemist.

[15] Daniel Sennert (Senartus) (1572-1637): Sennert, who was a professor at Wittenberg, in 1602, combined Galen's and Paracelsus' medicine in his studies; he explained the application of chemistry in medicine and also remarked to the weak points of Aristotle's philosophy. (See: *Brockhouse Enzyklopadie*. 17. vol., p- 311).

[16] Sâlih b. Nasrullah: *Fî hâzâ Kitâb al-Tibb al-Jadîd el-Kimyâi allazî İhtiraa-i Baraklisus*. (Arabian Manuscript). Suleymaniye Library. Hafîd Efendi Section. No: 269/1: Character of calligraphy: "nesih", inscription date: XII. century; Ayasofya Section, No: 367/1: Character of calligraphy: "nestalik", inscription date: 17 September 1087.

[17] Sâlih b. Nasrullah: op. cit.

[18] The copies of *Nuzhet al-Abdân fî Tarcamai Gâyat al-Itkân* studied in this paper are: Fatih Millet Library. Tib Section, No: 328: Character of calligraphy: "talik", copy date: 1153; Cerrahpasa Medical History Department Library; No: 544: Character of calligraphy: "nesih", copy date: 1166, calligraphist: Al-Hajj Mustafa b. Ahmet, written in date: 1141, translator: Hayatizâde Mustafa Fevzi.

[19] There are quotations from Ibn Sînâ in the said manuscript of Sâlih b. Nasrullah. (See: Fatih Millet Library; number: 328, fols.: 202a, 198a) and from Galen (Ibid., fols.: 210a). There are more examples to refer to.

[20] Sâlih b. Nasrullah: Fatih Millet Library: No: 328, fols.: 68a, 231b, 378b.

[21] Sâlih b. Nasrullah: Ibid., No: 328, fols.: 232a.

[22] Sâlih b. Nasrullah: Ibid., No: 328, fols.: 378b.

[23] Sâlih b. Nasrullah: Ibid., No: 328, fols.: 378b.

[24] Sâlih b. Nasrullah: Ibid. No: 328, fols.: 378b.

[25] Sâlih b. Nasrullah: Ibid., No: 328, fols.: 193a.

[26] Sâlih b. Nasrullah: Ibid., No: 328, fols.: 369b, 453b.

[27] Omer b. Sinan el-Iznîkî: *Shifâ al-Muminin (el-Tibb al-Kimyâî)*. Istanbul University Library. T. Y. 7083: Character of calligraphy: "nesih", copy date: 1107, Iznîkî is also the calligraphist of this copy, fols., 3b.

[28] Omer b. Sinan el-Iznîkî: One of the famous 18th century medical scientists of the Ottoman world. He has books on medical chemistry. (See: Mehmed Tahir (Bursali): op. cit., 3. vol., p. 228).

[29] Sanat-i Hermesiye: The art of Hermes. Hermes (Hermes Trismegitus): A god of the Hellenistic period was defined as a legendary alchemist in Egypt, according to the speculations of the late antique period. Most of the ancient works on chemistry were later referred to Hermes. (See: Colin A. Ronan: *Science Its History and Development Among the World's Cultures*. New York, 1982. Also see: Zeki Tez: *Kimya Tarihi*. Ankara, 1968, pp. 52-54; O. Hancerlioglu: op. cit., 2 vol., pp. 310-312).

[30] Omer b. Sinan: op. cit., Istanbul University Library. T. Y. 7083, See the preface: fols. 3b-31b.

[31] Hikma: "Wisdom": According to scholars "wisdom" is acquiring theoretical sciences and achieving the maturity of one's soul by forming the habit of doing one's best. Alchemists used to call their science "hikma". (See: *Islam Ansiklopedisi*. Istanbul, 1977 5/1. vol., p. 481).

[32] Omer b. Sinan el-Iznîkî: *Kitâb-i Kunûz-i Hayat al-insan Kavânîn-i Etibbâ-i Feylesofân*. Istanbul University Library. T. Y. 7140: Character of calligraphy: "nesih."

[33] Omer b. Sinan: op. cit., fols.: 2 a-b.

[34] Omer Sifâî (?-1742): He was born in Sinop. He was initiated to the Mevlevî order of dervishes and reached to the position of the "Dedelik" (Sheikh) and was called "Derviş Omer Sifai". Having visited Konya, Cairo and many other cities and towns, he finally settled in Prussia and served as a head physician at Yıldırım Beyazid Hospital. See: F. Nafiz Uzluk: "Bursali Tabib Mevlevî Omer Sefâî Dede". *Dirim*, sayı: 25, 1950, pp.: 170-175. Also see: KB. Kurdoğlu: *Sair Tabipler*. Istanbul, 1967, pp. 192-194; Mehmed Tahir (Bursali): op. cit., 3 vol. -pp. 228-229.

[35] Copies of Omer Sifai's we studied: *Jawhar al-farîd fit al-Tibb al-Jadîd*: Cerrahpasa Medical History Department Library. No: 196/1: Character of calligraphy: "nesih", copy date: 1112, calligraphist: Hamza Pasazâde Mehmed Serîf, Fatih Millet Library. Tip Section: 77: Character of calligraphy: "nesih", inscription date: 1174.

[36] Omer Sifai: op. cit., No: 196/1, fols.: 2 a-b.

[37] Omer Sifai: Ibid, No 196/1, Preface, fols.: 3a.

- [38] Omer Sifai: *Minhâcu's-Sifâi fî al-Tibb al-Kimyâi*. Istanbul University Library, T.Y. 7072: Character of calligraphy: "nesih", inscription date: 1169, Preface, fols: 6b-7a, for the medical composition, see: fols. 77a.
- [39] Omer Sifai: *Tibb al-Jadîd al-Kimyâi*. Istanbul University Library. T.Y. 7103: Character of calligraphy: "talik", inscription date: 1264.
- [40] Gevrekzâde Hafiz Hasan Efendi (7-1801): After graduating from madrasa, he was employed as an instructor at Suleymaniye Medical School. Later he was appointed as the chief physician. He wrote several medical works. (See: Suheyl Unver: "Gevrekzâde Hafiz Hasan". *Yuz Tip Buyugu Takvimi*. Istanbul, 1953.)
- [41] Gevrekzâde Hafiz Hasan: *Mursîd al-Alibbâ fî Tarcamati Ispagorya (Durru al-Mansur*. Cerrahpasa Medical History Department Library. No: 161/1: Character of calligraphy: "nestalik", inscriber: Seyyid Mehmed Riza, inscription date: 1259; Istanbul University Library. T.Y. 7085 Character of calligraphy: "talik", inscriber: Nafizzâde Ahmed Hamid, inscription date: 1241.
- [42] Gevrekzâde Hafiz Hasan: op. cit., No: 161/1, fols., 4b-5a.
- [43] *Kasîr al-Naf'*: Cerrahpasa Medical History Department Library. No: 434.
- [44] See: E.G. Browne: *Arabian Medicine*. London, 1962, Cambridge University Press; M. Ullmann: *Islamic Surveys II*. Edinburgh, 1978, Edinburgh University Press.
- [45] *Kasîr al-Naf'*: fol.: 2b.
- [46] *Kasîr al-Naf'*: fols. 3b-4a; Gevrekzâde Hafiz Hasan: op. cit., Istanbul University Library. No: 7085, fols.: 9a; Omer b. Sinan: *Sifa al-Muminin*. Istanbul University Library. No: 7083, fols.: 7a-b.
- [47] *Kasîr al-Naf'*: fol.: 4b; Omer b. Sinan: Ibid., No: 7083, fols: 8a-b.
- [48] *Kasîr al-Naf'*: fol.: 4a; Omer b. Sinan: Ibid., No: 7083, fols.: 7b-8a.
- [49] See Staislas Klossowski de Rola, *The Secret Art of Alchemy*, London, 1973, p. 19; H.E. Sigerist: op. cit., p. 170. For detailed data on the theories of Paracelsus, see: Walter Pagel: "Paracelsus Theophrastus Phillipus Aureoulu Bombastus von Homenheim". *Dictionary of Scientific Biography*, vol. X, Ed. C.C. Gillispie, New York, 1974, pp. 304-313; Colin A. Ronan: *Science Its History and Development Among The World's Cultures*. New York, 1982, p. 310; Ernst Kaiser: *Paracelsus*. Hamburg, 1969; E.J. Holmyard: *Alchemy*. 'Great' Britain 1968, pp. 165-176.
- [50] *Kasîr al-Naf'*: fols.: 6b-7 a-b; Omer b. Sinan: op. cit., No: 7083, fols.; 8a.
- [51] *Kasîr al-Naf'*: Jol.: 7a.
- [52] *Kasîr al-Naf'*: Jol.: 7a.
- [53] Allen C. Debus: *Myticism and Rise of Modem Science*, pp. 47, 49.
- [54] *Kasîr al-Naf'*: fols.: 8 a-b; Omer b. Sinan: op. cit., No: 7083, fols.: 8b-9 a-b.
- [55] The universe and the world are an integrated whole. The sun stars and planets influence plants, animals

and human beings. Consequently, drugs prepared from plants, animals and minerals are under the influence of the universe. The idea reflects the relationship between the macro cosmos and the micro cosmos. (See: T.P. Sherlock: "The Chemical Work of Paracelsus". *Journal of the Society for the Study of Alchemy and Early Chemistry*, vol. III, May 1948, No: 1 and 2, pp. 34-35.)

[56] See: Allen G. Debus: op. cit., p. 53.

[57] See: T.P. Sherlock: op cit., pp. 33-63. Also see: *The Philosophical Background*. pp. 34-35.

[58] *Kasîr al-Naf'*: fols.: 8b.

[59] *Kasîr al-Naf'*: fols.: 9a.

[60] *Kasîr al-Naf'*: fob.: 9 a-b. Another story like this is recorded in *Kunûz-i Hayât al-Insan Kavanîn-i Atibbâ-i Feylesofân* by Omer b. Sinan. (fols.: 5 a-b.)

[61] *Kasîr al-Naf'*: fols.; 9 a-b.

[62] *Kasîr al-Naf'*: fols.; 9b-10a.

[63] Pliny (23-79 A.D.): A writer of "Natural History", also including the subject's medicine, geography, meteorology, anthropology, botany, zoology and mineralogy. During the middle Ages, it was translated into several languages, in the east and west. In this book of the classical period many strange stories are told in it. (See: F.H. Garrison: op. cit., p. 112.)

[64] *Kasîr al-Naf'*: fols.: 6 a-b.

[65] See: F. H. Garrison: op. cit., p. 205; Sigerist; op. tit., pp. 169-170.

[66] Sigerist: Ibid., p. 169.

[67] *Kasîr al-Naf'*: fols., 11 a-b.

[68] Sigerists: op. cit., p. 169.

[69] *Kasîr al-Naf'*

[70] *Kasîr al-Naf'*: fols.: 11b-12a.

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[71] Omer b. Sinan: *Tibb-i Kimyâî*. fol: 5b.

[72] A. G. Debus: op. cit., pp. 57-88.

[73] See: Suheyl Unver: "İtalya ile Türkiye Arasında Tarihte Tıbbi Münasebetler Hakkında". *İ. U. Tıp Fakültesi Mecmuası*, vol. 18, No: 2, 1955.

[74] See: Hammer: *Histoire de L 'Empire Ottoman*, vol. XVI, pp. 171-172.

[75] See: Nil San: "18. ve 19. Asirda kimyager hekimlerin kullandiklari aletler". *Tip Tarihi Arastirmalari*, No: 1, Istanbul, 1986, p. 53.

[76] See: Nil San: op. cit., p. 56.

[77] See: Nil San: op. cit., p. 62.

[78] *Kasîr al-Naf'*: fols.: 23b-185b; 189a-192b.

[79] See: Robert Multhauf: "The Significance of distillation in Renaissance Medical Chemistry". *Bulletin of the History of Medicine*, No: 30, 1956, pp. 329-246.

[80] *Kasîr al-Naf'*: fols.: 23b.

[81] *Kasîr al-Naf'*: Mau'l-Mâ-i hulya (Medicinal liquid for "mal-i hulya") I. book, fols.: 29a; Iksîr-i zehebu'l-kadîr (Gold elixir tonic) I. book, fols.: 49a, e.t.c.

[82] *Kasîr al-Naf'*: Macun al-zumrud (Emeraldpaste), Cevâris-i kibrit (Sulphur). III. book, fols.: 225b.

[83] *Kasîr al-Naf'*: I. book, fol: 23b.

[84] *Kasîr al-Naf'*: fols.: 4b, 6a.

[85] See: A.G. Debus: op. cit., p. 54.

[86] The theory of signatures: The conviction that every plant had a sign given by the Creator. The shape of the plant, its similarity to an organ, its colour and sometimes smell give a clue about how and where it should be used. For example, "Kirlangic otu" (*Chelidonium maius*) is used to treat hepatitis, as it had a yellow latex; "boyaci koku" (*Rubia tinctorum*), is used for helping menstruation, as it contains a red latex; "bean " was used to treat renal diseases, for it was in the shape of a kidney; "ginseng" (*Panax ginseng*) was used as an aphrodisiac, for it looked like human hip.

[87] "Mâl-i hulyâ": A mental illness, the symptoms of which were believed to be fear, obsession, and sadness. (See: Nil Sari: *Mal-i Hulya ve Tedâvisi*, Istanbul, 1982, Assoc. Professorship thesis.)

[88] "Sevdâ" Black bile; mental illnesses and other diseases due to the increase of black bile, one of the four elements believed to exist in the body.

[89] "Stidde": Blockage of the vessels, canals or cavities in the body, because of various reasons.

[90] "Tesennuc": Muscle spasm; convulsion.

[91] "Gasy": Fainting.

[92] "Hafakan": An illness accompanied with tachycardia, pessimism and anxiety.

[93] *Kasîr al-Naf'*: fols.: 23b, 192b; Omer Sifai: *Tibb-i Jadîd-i Kimyâî* No: 7103; Omer b. Sinan: *Kitâb-i Kunûz-i*

Hayat al-Insan Kavânîn-i Atibbâ-i Feylesofân. No: 7083, fols.: 5a; Gevrekzâde Hafiz Hasan, *Mursid al-Alibbâ fî Tarcamati Ispagorya*. No: 161/1, fols.: 6b.

[94] A. G. Debus: op. cit., p. 54.

[95] Gevrekzâde Hafiz Hasan: op. cit., fols.: 4b.

[96] Gevrekzâde Hafiz Hasan: Ibid, fols.: 6 a-b.

[97] See: Ahmet Refik: *Onikinci Asırda İstanbul Hayatı*. 1100-1200. İstanbul, 1930, p. 37.

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